



Francesca Sassi, LPD LP-PM, April 2010

Absolute surveillance of the installation! Digital instruments DIN rail and front panel

Digital Measuring Instruments

Going digital...



How they work

- Digital instruments display the value of measurement in figures
- The LED display makes reading clear and sharp
- Setting of CT ratio is made
- Installation is on the DIN rail or on the front panel of low and medium voltage switchboards

Digital Measuring Instruments

The DIN rail range



AMTD - 1 - R

AMTD = Ammeter
 VLMD = Voltmeter
 1 = Alternate current
 2 = Direct current
 Alarm Relay

System	Measure	Range	Unit	Insertion		Type
Alternate and direct	Voltage	0...600	V	Direct		VLMD-1-2 VLMD-1-2-R
				Alternate Current	Current	0...999
	Frequency	40...60	Hz		Direct	
Direct Current	Current	0...999	A	Indirect	Shunt	AMTD-2 AMTD-2-R

Digital Measuring Instruments

The front panel range



AMTD-1-R P

AMTD = Ammeter

VLMD = Voltmeter

1 = Alternate current

2 = Direct current

Alarm relay

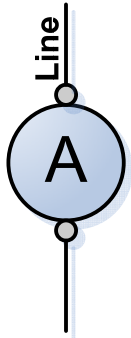
Size 36x72

System	Measure	Range	Unit	Insertion		Type
Alternate and direct current	Voltage	0...600	V	Direct		VLMD P VLMD-R P
				Alternate current	Current	0...999
Direct current	Current	0...999	A	Indirect	Shunt	AMTD-2 P AMTD-2-R P

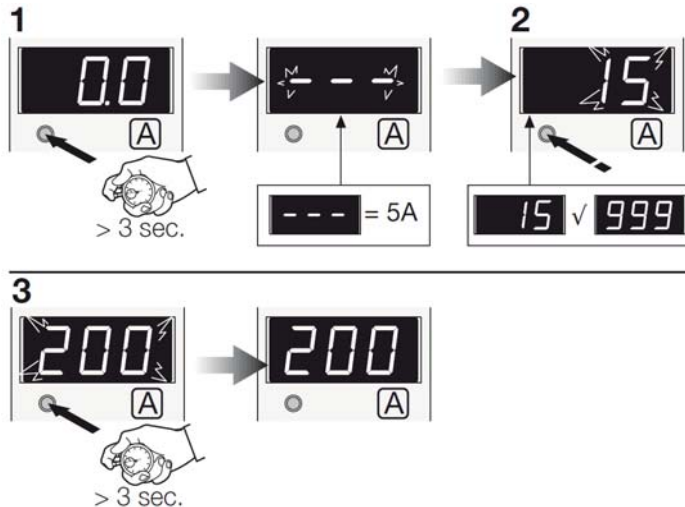
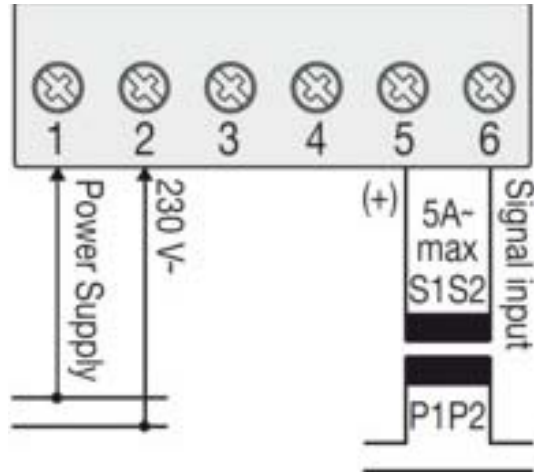
Digital Measuring Instruments

Installation and setting at a glance: AMTD-1 and P

Ammeters are connected in series to the load. For indirect insertion, CT primary crosses or surrounds the line cable according to the CT kind (wound or through primary)



Wiring scheme



Wiring

- Connect auxiliary supply 230V
- Connect CT S1-S2 cables
- Please respect CT terminals order to ensure device working
- Earthing of CT terminals is allowed

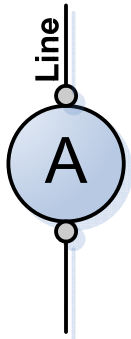
Programming

- Use pushbutton to enter programming mode
- Scroll primary rated current values up to the suitable one
- Push button again to confirm

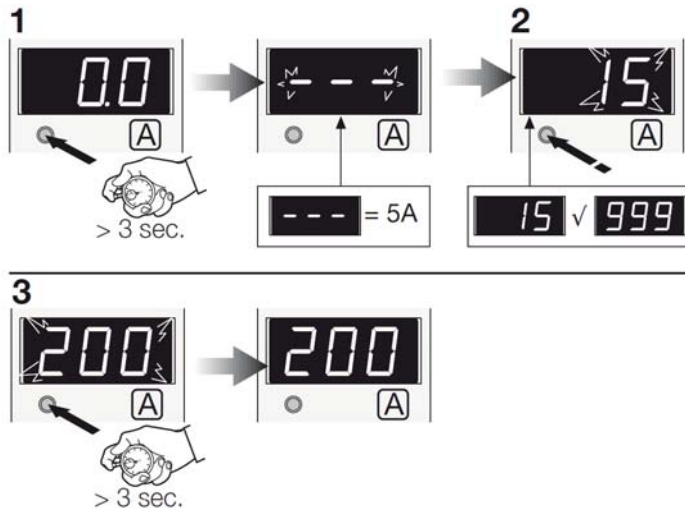
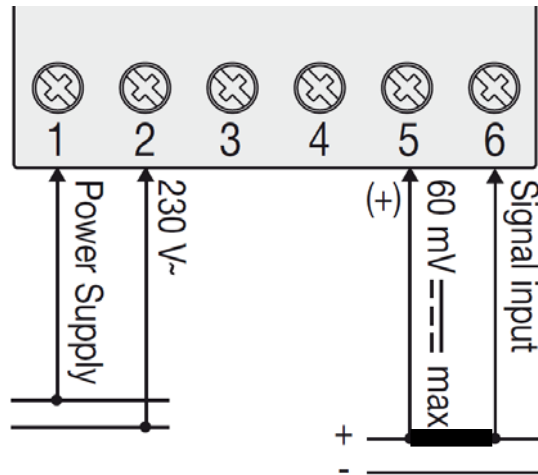
Digital Measuring Instruments

Installation and setting at a glance: AMTD-2 and P

Ammeters are connected in series to the load. For indirect insertion in direct current, line passes through shunt primary, which is a very low and calibrated resistance.



Wiring scheme



Wiring

- Connect auxiliary supply 230V
- Connect 60mV shunt cables
- Please respect shunt terminals order to ensure device working

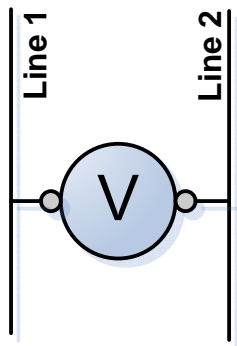
Programming

- Use pushbutton to enter programming mode
- Scroll primary rated current values up to the suitable one
- Push button again to confirm

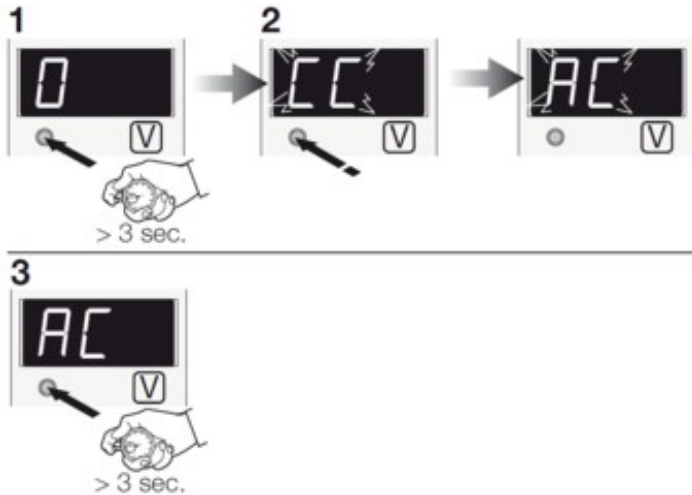
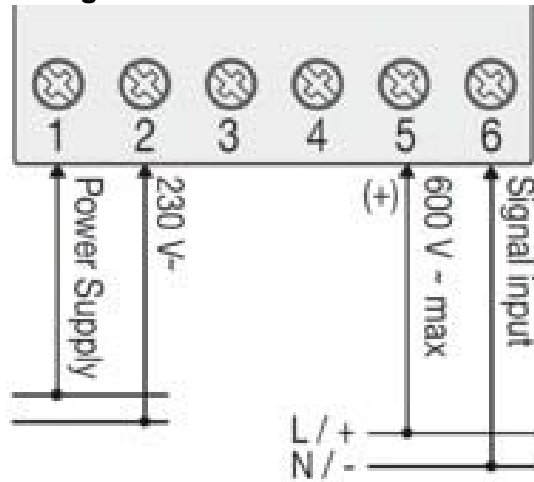
Digital Measuring Instruments

Installation and setting at a glance: VLMD-1-2 and P

Voltmeters are connected in parallel to the load and can be inserted to measure either line voltage, or phase voltage, or both via a rotary switch.



Wiring scheme



Wiring

- Connect auxiliary supply 230V
- Connect measuring cables
- Please respect measuring terminals order to ensure device working
- Same wiring for FRZ-DIG

Programming

- Use pushbutton to enter programming mode
- Scroll primary voltage kind between DC (CC) and AC (AC)
- Push button again to confirm

Digital Measuring Instruments with alarm relay

Get warned...



How they work

- As a standard digital instrument, they display the value of measurement in figures
- Thanks to the internal power relay they match measurement features with monitoring relays functions, in a single three modules device
- Peak values visualization, maximum and minimum

Digital Measuring Instruments with alarm relay

Get warned...



How they work








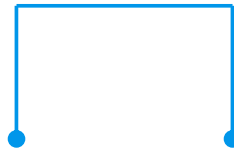

- Whenever threshold is overtaken, relay trips after preset delay and display digits show **ALL**
- Peak values are stored in devices memory and can be scrolled by pushing the front pushbutton
- When relay is set in positive safety, alarm condition happens also on auxiliary supply failure

Digital Measuring Instruments with alarm relay

Advantages – Positive safety



- Relay settings

		Default N.O.	Positive safety N.C.
	Not powered		
	Powered Not in alarm		
	Powered In alarm		

Digital Measuring Instruments with alarm relay

Advantages



- Monitoring of direct current loads with AMTD-2-R
- Internal relay with rated current
 - 16A AC1
 - 3A AC15
- Complete and detailed programming of the alarm condition
 - Alarm threshold programmable
 - Alarm tripping time adjustable
 - Hysteresis programmable
- Visual signalling of the alarm condition

Digital Measuring Instruments with alarm relay

Comparison with monitoring relay

Monitoring relay



Instruments with alarm relay



Alarm threshold setting	Trimmer		Value selectable	
Tripping time delay	Trimmer		Value selectable in seconds	
Hysteresis	% of threshold with trimmer		% of threshold	
Relay rated current	16A		AC1 16A AC15 3A	
Positive safety	By wiring		Programmable	
Visual signaling of alarm	n.a.		On display	
D.c. loads monitoring	n.a.		AMTD-2-R	

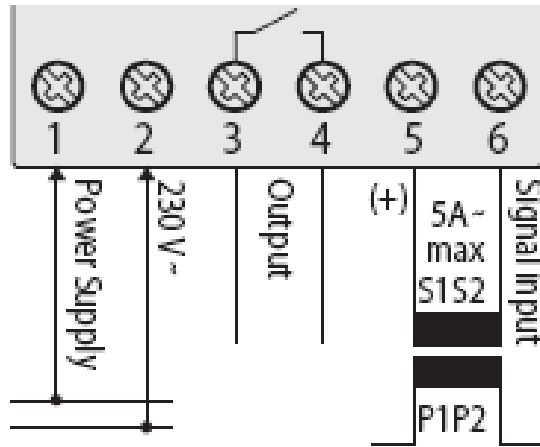
Digital Measuring Instruments with alarm relay

Installation and setting at a glance: AMTD-1-R, -2, P

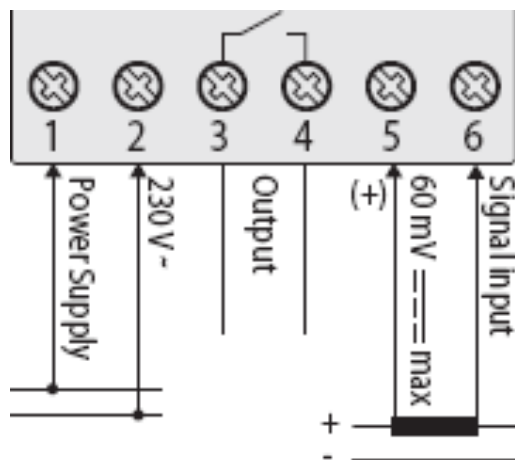
Ammeters are connected in series to the load. For indirect insertion, CT primary crosses or surrounds the line cable according to the CT kind (wound or through primary)



Wiring scheme AMTD-1-R and AMTD-1-R P



Wiring scheme AMTD-2-R and AMTD-2-R P

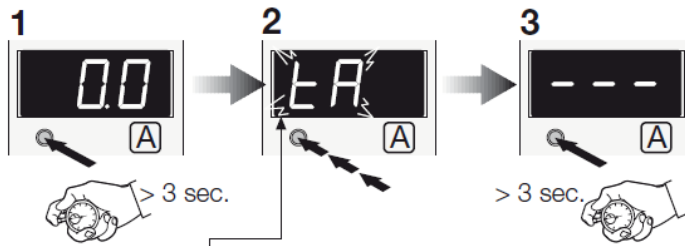
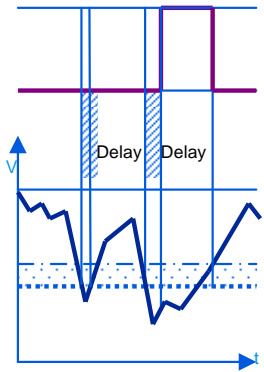


Wiring

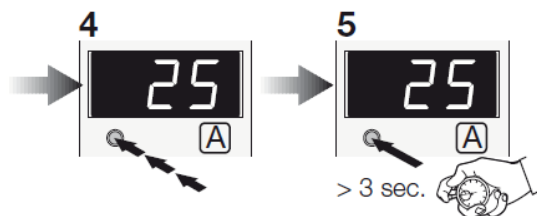
- Connect auxiliary supply 230V
- Connect CT S1-S2 cables
- Please respect CT terminals in order to ensure device working
- Earthing of CT terminals is allowed

Digital Measuring Instruments with alarm relay

Installation and setting at a glance: AMTD-1-R, -2-R, P



- EA** Full scale setting [A]
- EHL** Minimum alarm threshold [A]
- EHH** Maximum alarm threshold [A]
- dLY** Alarm tripping delay [sec.]
- HSE** Alarm cutout hysteresis [%]
- OUT** Alarm output configuration
- RES** Reset min and max values

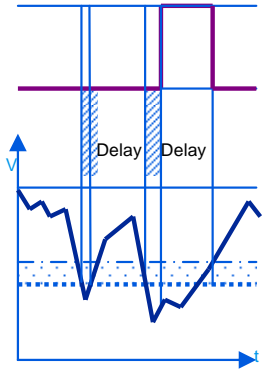


Programming

- Use pushbutton to enter programming mode
- Scroll parameters to set up
- Set values for each needed parameter
- Push again to confirm and exit setup mode

Digital Measuring Instruments with alarm relay

Installation and setting at a glance: AMTD-1-R, -2-R, P



EA

Full scale setting [A]

- --- = direct insertion without CT
- 15, 20, 25, 40, 60, 100, 150, 200, 250, 400, 600, 999 A full scale values available

EHH

Maximum alarm threshold [A]

- --- = alarm function disabled
- CT up to 100 A, resolution 1A
- CT up to 600 A, resolution 10A

EHL

Minimum alarm threshold [A]

- --- = alarm function disabled
- CT up to 100 A, resolution 1A
- CT up to 600 A, resolution 10A

dLY

Alarm tripping delay in seconds

- 1-5-10-20-30
- ! = tripping without delay

HSt

Alarm cutout hysteresis in % of the threshold

- 5-10-20-40

Out

Alarm output configuration

- nO/nC

rES

Reset min and max values

- Select the number 5 to reset the values, which is subsequently confirmed by the displaying three points

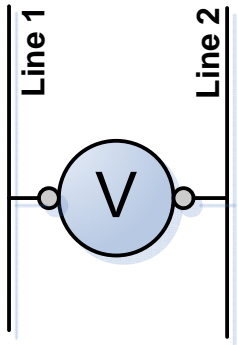
Parameters

- **tA**: line rated current full scale setting
- **tHL**: minimum current threshold
- **tHH**: maximum current threshold
- **dLY**: tripping delay of alarm
- **Hst**: percentage of hysteresis
- **Out**: choice between normally open or normally closed
- **rES**: reset of peak values

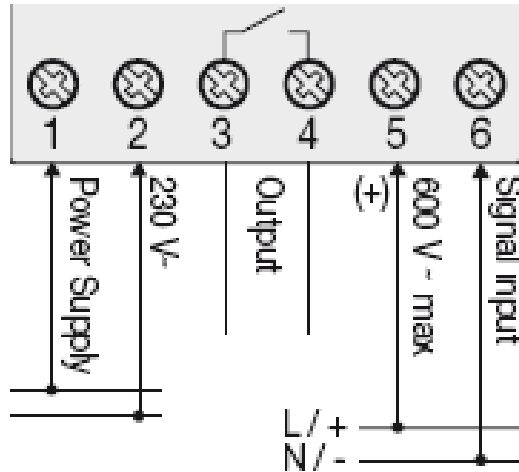
Digital Measuring Instruments with alarm relay

Installation and setting at a glance: VLMD-1-2-R and P

Voltmeters are connected in parallel to the load and can be inserted to measure either line voltage, or phase voltage, or both via a rotary switch.



Wiring scheme VLMD-1-2-R and VLMD-R P

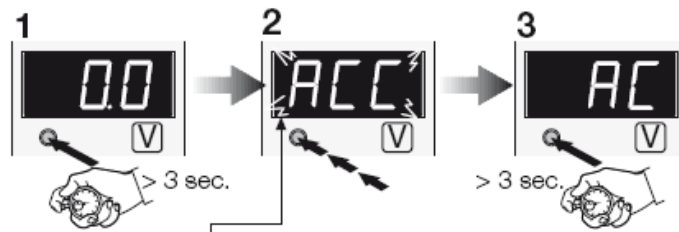
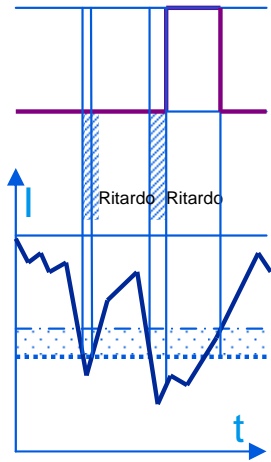


Wiring

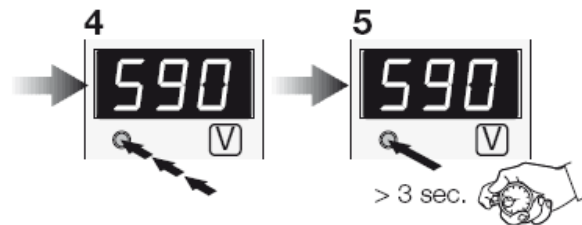
- Connect auxiliary supply 230V
- Connect measuring cables
- Please respect measuring terminals order to ensure device working
- Connect terminals 3-4 of output relay to a load to control or to an external relay

Digital Measuring Instruments with alarm relay

Installation and setting at a glance: VLMD-1-2-R e P



- ACC** Select current to use
- EHL** Minimum alarm threshold [V]
- EHH** Maximum alarm threshold [V]
- dLY** Alarm tripping delay [sec.]
- HSE** Alarm cutout hysteresis [%]
- OUT** Alarm output configuration
- RES** Reset min and max values

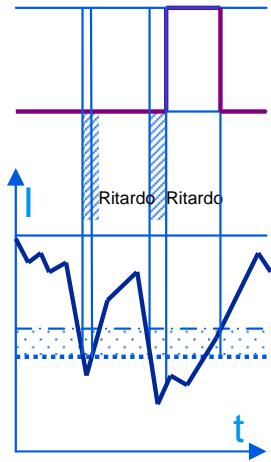


Programming

- Use pushbutton to enter programming mode
- Scroll parameters to set up
- Set values for each needed parameter
- Push again to confirm and exit setup mode

Digital Measuring Instruments with alarm relay

Installation and setting at a glance: VLMD-1-2-R e P



ACC

Select current to use

- **CC** = direct current
- **AC** = alternating current

tHL

Minimum alarm threshold [V]

- **---** = alarm function disabled
- 10 ÷ 590 V full scale values available resolution 10 V

tHH

Maximum alarm threshold [V]

- **---** = alarm function disabled
- 10 ÷ 590 V full scale values available resolution 10 V

dLY

Alarm tripping delay in seconds

- 1-5-10-20-30
- **|** = tripping without delay

HSt

Alarm cutout hysteresis in % of the threshold

- 5-10-20-40

Out

Alarm output configuration

- nO/nC

rES

Reset min and max values

- Select the number 5 to reset the values, which is subsequently confirmed by the displaying three points

Parameters

- **ACC**: select current of use
- **tHL**: minimum alarm threshold [V]
- **tHH**: maximum alarm threshold [V]
- **dLY**: alarm tripping delay in seconds
- **Hst**: alarm cutout hysteresis
- **Out**: alarm output configuration NA or NC (positive safety)
- **rES**: reset min and max values

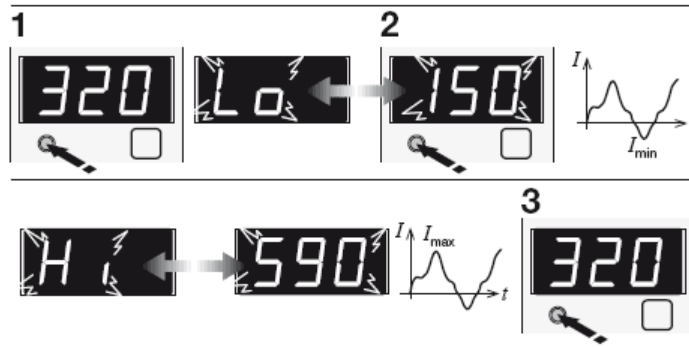
Digital Measuring Instruments with alarm relay

Peak visualization: maximum and minimum



VLMD-1-2-R, AMTD-1-R, AMTD-2-R

VLMD-R P, AMTD-1-R P, AMTD-2-R P



- Peak values are stored in the internal memory
- Peak values can be reset

Visualization

1. When you briefly press the front button, the word **Lo** and the minimum value measured appear alternately
2. If you press the button again, the word **Hi** appears with the maximum value measured
3. Press the button again to return to normal view

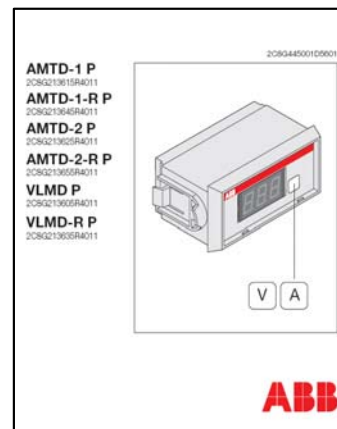
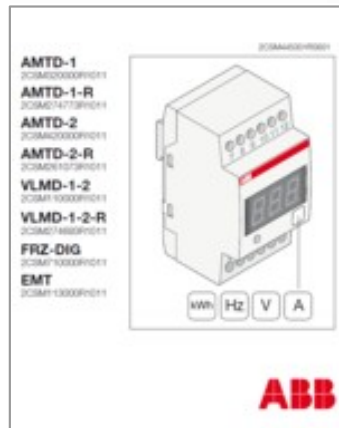
Digital Measuring Instruments

Plenty of advantages for the panel builder



As ABB digital meters...

- Wide measurement range, thanks to the use of accessories CTs and shunts
- Red LED display
- Compact size: 3 DIN modules and depth of only **52 mm** into the switchboard for front panel version
- Power supply separated from the measuring circuit
- Full scale programmable
- Accuracy class 0,5% F.S. ± 1 digit
- Complete and detailed instruction booklet, in seven languages



Digital Measuring Instruments

Plenty of advantages for the panel builder

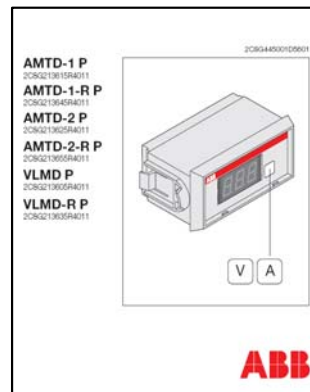
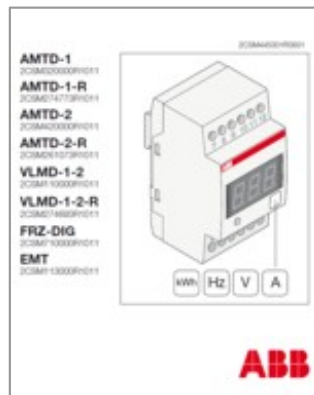


Best reading

- High accuracy in measure, certified class 0,5
- High accuracy in reading measured values, thanks to digital display
- LED 7 segment digits can be read from a distance and in the dark

Easy and long lasting

- Easy and quick setting and re-setting
- Seven languages detailed instruction booklet
- Electronic measurement brings does not foresee mechanical friction which could affect traditional analogue devices



Digital Measuring Instruments

Plenty of advantages for the wholesaler

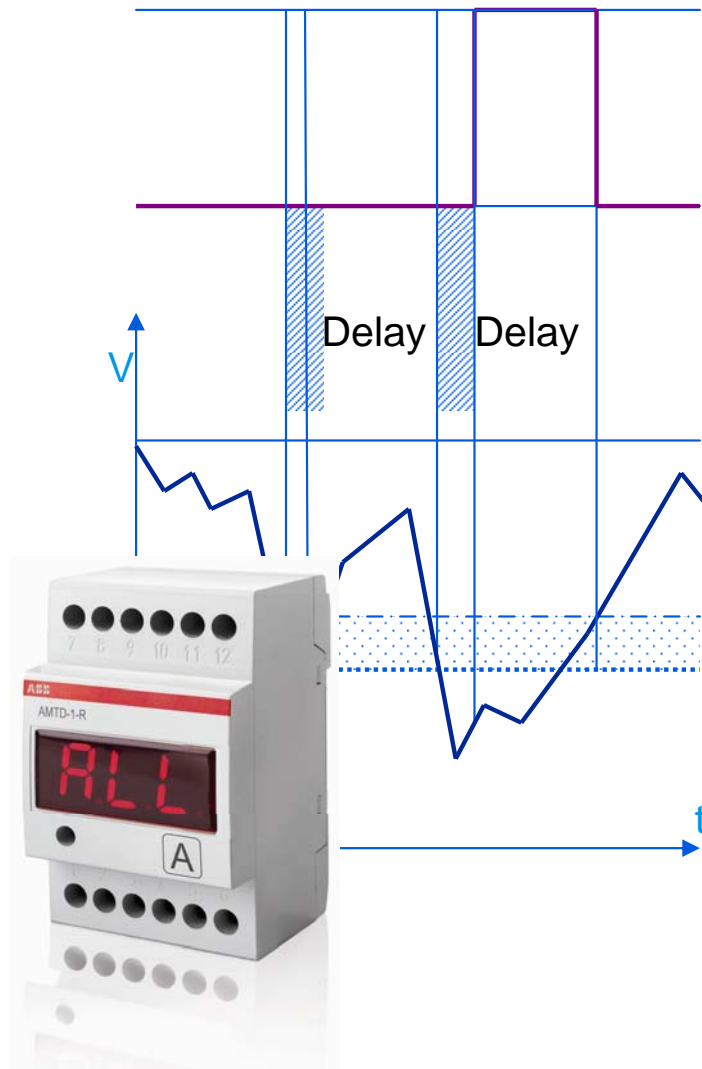


A range for professionals!

- All digital DIN rail instruments customers need, in three modules only
- Few codes for any range of measure
- The range of a speciality manufacturer with a global supplier brand
- Complete range of accessories

Digital Measuring Instruments with alarm relay

Plenty of advantages for the panel builder



More features!

- Monitoring of direct current loads with AMTD-2-R and AMTD-2-R P
- Internal power relay with rated current
 - 16A AC1
 - 3A AC15
- Complete and sharp programming of the alarm condition
 - Alarm threshold
 - Alarm tripping time
 - Hysteresis
- Visual signalling of the alarm condition
- Peak values visualization, maximum and minimum

Ammeter with alarm relay AMTD-2-R

Application – Process of cycle status signalling

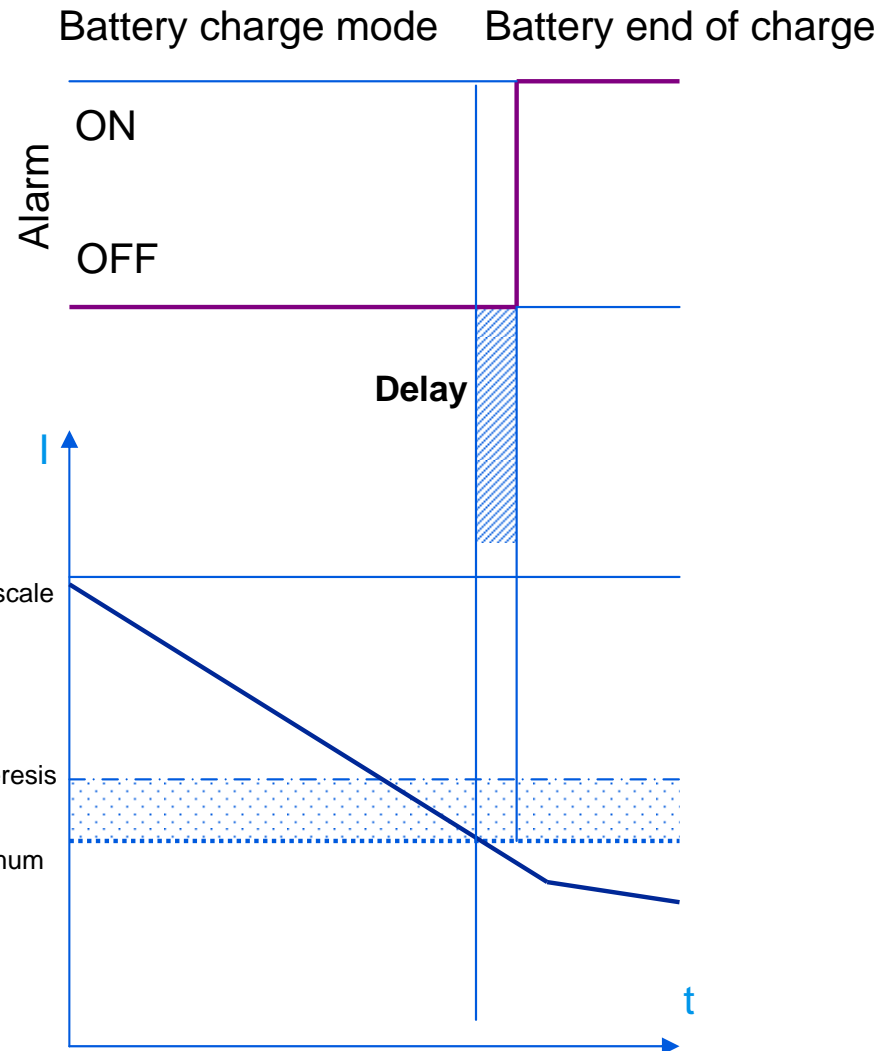
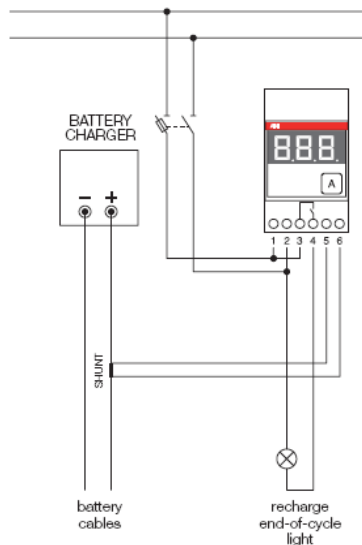


- Thanks to AMTD-2 it's possible to take under control all auxiliary processes supplied with direct current
- This was not possible up to now with monitoring relay

Ammeter with alarm relay AMTD-2-R

Application – Process of cycle status signalling

- Monitoring of recharging process completion of an electric hoist battery



Voltmeter with alarm relay VLMD-1-2-R and P

Applications – Monitoring of minimum voltage

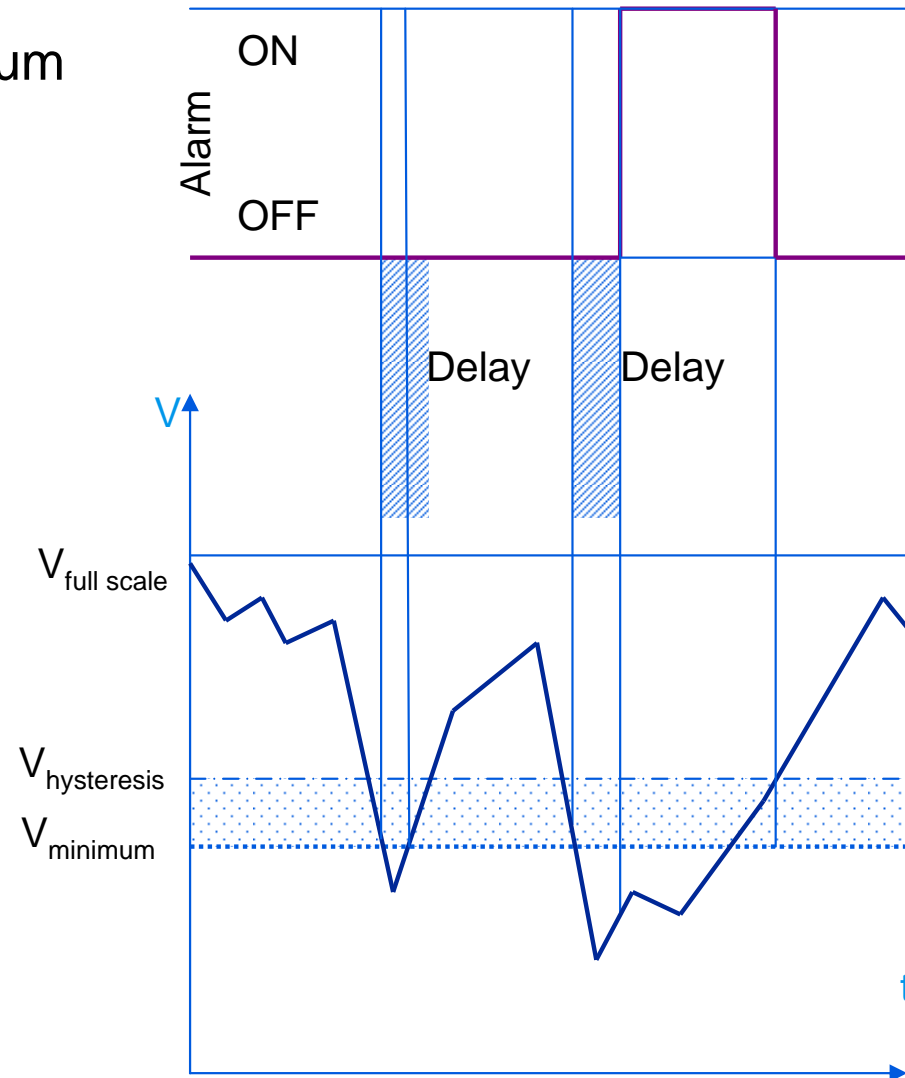
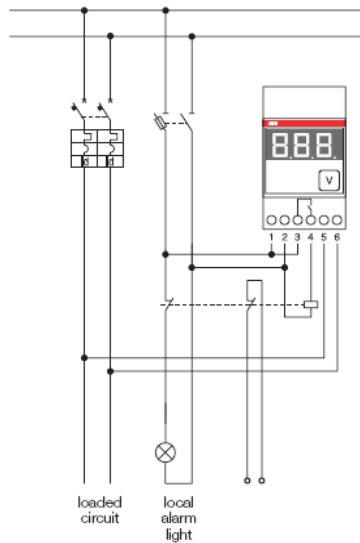


- Voltage monitoring is extremely important when a switchboard contains many contactors for controlling the lighting system.
- If the power supply voltage drops and remains below the coil tolerance value, the risk of overheating is very high
- By monitoring voltage and setting an appropriate under voltage alarm, failures and overheating can be prevented and fire hazard can be reduced

Voltmeter with alarm relay VLMD-1-2-R and P

Applications – Monitoring of minimum voltage

- Monitoring of minimum voltage



Ammeter with alarm relay AMTD-1-R and P

Application – Small everyday operations automating

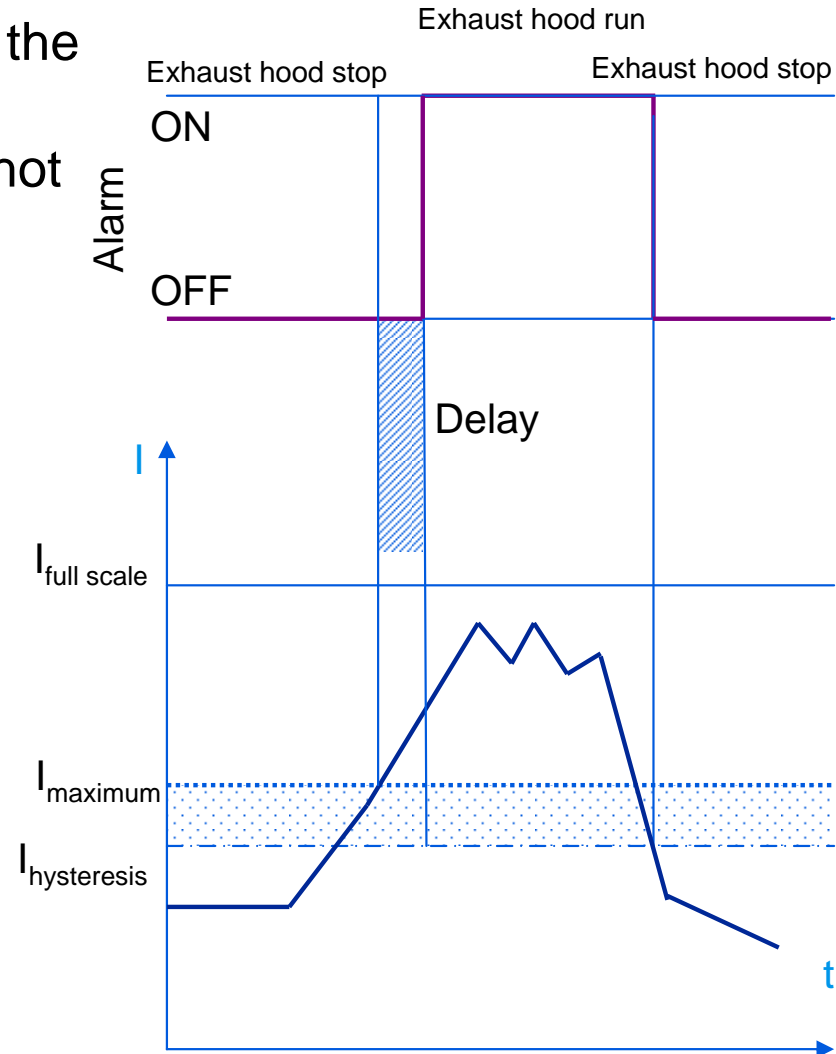
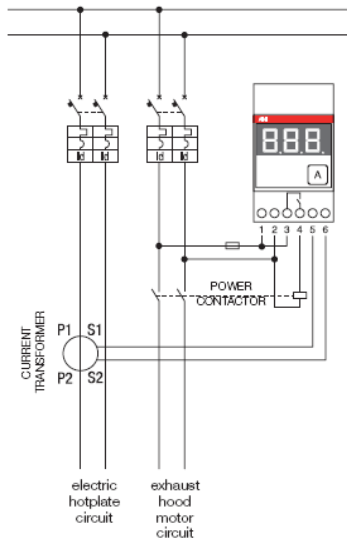


- The versatility of digital instruments with alarm relay guarantees their use in a lot of application
- Digital instruments allow execution of little automation in tertiary and distribution application, thanks to their ease of use

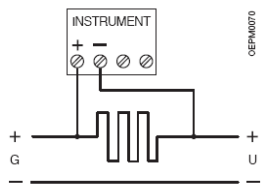
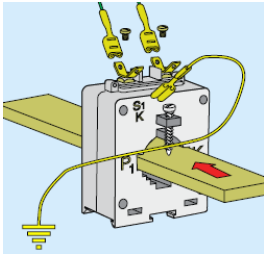
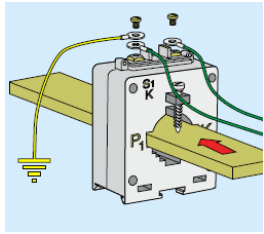
Ammeter with alarm relay AMTD-1-R and P

Application – Small everyday operations automating

- Automatic activation of the exhaust hood when switching on electrical hot plates



Digital Measuring Instruments Accessories



Current Transformers

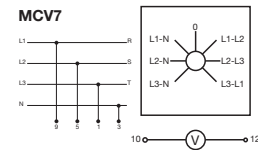
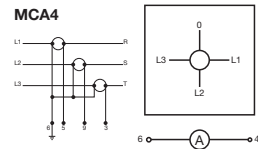
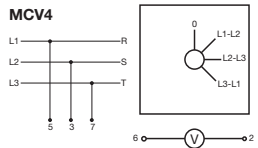
- CT with primary current up to 6000 Amps
- Both wound and through primary...even modular!
- Different types of installation and conductors
- 5 Amps output current

Shunt

- Use to connect direct current ammeters
- Wide range up to 6000 Amps



Digital Measuring Instruments Accessories



Switches

- To display several line and phase measures on the same instrument
- DIN rail and front panel mounting

Power and productivity
for a better world™

